IN THE CLAIMS:

Please find a listing of the claims below, with the statuses of the claims shown in parentheses. This listing will replace all prior versions, and listings, of claims in the present application.

1. (Currently amended) An apparatus for processing a color image[[s]], comprising:

an input processor~~, wherein [[an]]~~ configured to receive the color image ~~is received~~;

a Retinex-type processor, comprising:

a local statistics processor[[,]] comprising a cascaded recursive filter, and

a point operation processor ~~correcting~~ configured to correct pixels of the input color image according to corresponding pixel values in the local statistics processor; and

an output processor configured to transform the corrected pixels into an output signal that is indexed to represent an intensity of a particular position in the color image.

2. (Currently amended) The apparatus of claim 1, wherein the cascaded recursive filter is a cascade of filters of the form:

$$\begin{aligned} L_{i,j}^{SE} = \max\{&\alpha(\nabla_x S)\cdot L_{i-1} + (1-\alpha(\nabla_x S))\cdot S_{i,j}, \\ &\alpha(\nabla_y S)\cdot L_{j-1} + (1-\alpha(\nabla_y S))\cdot S_{i,j}, S_i\} \end{aligned}$$

, wherein L represents illumination, $\alpha(\nabla S)$ is a scale independent parameter, S is the input color image, and ∇S is a scaled gradient, whereby SE above may be replaced by one of N, S, E, W, NE, NW, or SW according to standard compass notations corresponding to a direction of information flow.

3. (Currently amended) The apparatus of claim 2, wherein a parameter α of the cascaded recursive filter is a function of an input signal of the <u>color</u> image.

4. (Original) The apparatus of claim 3, wherein the parameter α is a function of a local gradient ∇s, which returns a constant value α_0 for large ∇s values and decreases monotonically to zero as ∇s decreases.

5. (Original) The apparatus of claim 4, wherein α (∇s) is scale independent.

6. (Original) The apparatus of claim 5, wherein,

$$\alpha(\nabla S, \nabla_N S, N) = \begin{cases} \dfrac{\sqrt[N]{\alpha_0^{N_0}}}{\sqrt[N]{\alpha_0^{N_0}} \cdot e^{\beta \cdot \min\{\nabla S, 0\}}} & \nabla_N S \geq -T, \\ & \nabla_N S < -T \end{cases}$$

wherein N is a size of the input image S, wherein $\nabla_N S$ is a scaled gradient, wherein T is a threshold value, and wherein β is a constant parameter.

7. (Currently amended) The apparatus of claim 6, wherein the scaled gradient of the <u>color</u> image is

$$\nabla_N S = \sum_{i=\Delta_N^- + 1}^{\Delta_N^+} \left| S(i+j) - S(i+j-1) \right|$$

8. (Canceled).

9. (Currently amended) The apparatus of claim [[8]]2, wherein [[a]] the scaled gradient of the color image is

$$\nabla_N S = S\left(i + \Delta_N^+\right) - S\left(i + \Delta_N^-\right)$$

where $\Delta_N^+ + \Delta_N^- = \left\lfloor N / N_0 \right\rfloor$, and $\Delta_N^+ + 1 \geq \Delta_N^- \geq \Delta_N^+$.

10. (Currently amended) An apparatus for fast Retinex processing, said apparatus comprising:

a robust recursive envelope operator for fast Retinex processing, said operator having ~~comprising:~~ a cascaded recursive filter~~, comprising~~ wherein the cascaded recursive filter is used to calculate an illumination L at a particular position in an input image signal S using the following equation:

$$\begin{aligned} L_{i,j}^{xx} = \max\{&\alpha(\nabla_x S) \cdot L_{i-1,j} + (1-\alpha(\nabla_x S)) \cdot S_{i,j}, \\ &\alpha(\nabla_y S) \cdot L_{i,j-1} + (1-\alpha(\nabla_y S)) \cdot S_{i,j}, S_i\}, \end{aligned}$$

, wherein ∇ is a gradient function, ~~wherein~~ α (∇ *s*) comprises a scale independent parameter, wherein xx comprises a compass notation, and wherein the robust recursive envelope operator processes [[an]] the input image signal S.

11. (Currently amended) The ~~robust recursive envelope operator~~ apparatus of claim 10, wherein α is a function of the input image S.

12. (Currently amended) The ~~robust recursive envelope operator~~ apparatus of claim 11, wherein the function is a Huber function.

13. (Currently amended) The ~~robust recursive envelope operator~~ apparatus of claim 10, wherein α is a function of one or more parameters,

$$\alpha(\nabla S, \nabla_N S, N) = \begin{cases} \sqrt[N]{\alpha_0^{N_0}} & \nabla_N S \geq -T, \\ \sqrt[N]{\alpha_0^{N_0}} \cdot e^{\beta \cdot \min\{\nabla S, 0\}} & \nabla_N S < -T \end{cases}$$

wherein N is a size of the input image S, wherein $\nabla_N S$ is a scaled gradient, wherein T is a threshold value, and wherein β is a constant parameter.

14. (Currently amended) The ~~robust recursive envelope operator~~ apparatus of claim 10, wherein the compass notation is one or more of SE, SW, NE, NW, and wherein application of the cascaded recursive filter follows the compass notations.

15. (Canceled).

16. (Currently amended) ~~The method of claim 15,~~ A method for processing an input image S, comprising:

producing an output illumination signal through application of the following equation ~~wherein the cascaded recursive filter is of the form~~:

$$\begin{aligned} L_{i,j}^{SE} = \max\{&\alpha(\nabla_x S) \cdot L_{i-1,j} + (1-\alpha(\nabla_x S)) \cdot S_{i,j}, \\ &\alpha(\nabla_y S) \cdot L_{i,j-1} + (1-\alpha(\nabla_y S)) \cdot S_{i,j}, S_i\}, \end{aligned}$$ wherein L represents illumination,

$\alpha(\nabla S)$ is a scale independent parameter, and ∇ is a gradient function, whereby SE above may be replaced by one of N, S, E, W, NE, NW, or SW according to standard compass notations corresponding to a direction of information flow;

producing a reflectance signal from the output illumination signal;

transforming the reflectance signal into an output reflectance signal; and

outputting the output reflectance signal.

17. (Currently amended) The method of claim 16, wherein [[a]] the parameter α ~~of the cascaded recursive filter~~ is a function of an input signal of the image.

18. (Original) The method of claim 17, wherein the parameter α is a function of a local gradient ∇s which returns a constant value α_0 for large ∇s values and decreases monotonically to 0 as ∇s decreases.

19. (Original) The method of claim 16, wherein a α (∇s) is scale independent.

20. (Original) The method of claim 19, wherein

$$\alpha(\nabla S, \nabla_N S, N) = \begin{cases} \sqrt[N]{\alpha_0^{N_0}} & \nabla_N S \geq -T, \\ \sqrt[N]{\alpha_0^{N_0}} \, . e^{\beta \cdot \min\{\nabla S, 0\}} & \nabla_N S < -T \end{cases}$$

wherein N is a size of the input image S, wherein $\nabla_N S$ is a scaled gradient, wherein T is a threshold value, and wherein β is a constant parameter.

21. (Original) The method of claim 20, wherein N_0 equals 256.

22. (Currently amended) The method of claim 20, wherein applying the cascaded filter producing an output illumination signal further comprises sequentially applying [[the]] a cascaded filter following a compass notation.

23. (Currently amended) The method of claim 22, wherein the sequential application of the cascaded filter comprises SE, SW, NW, NE compass notations.

24. (Currently amended) The method of claim 22, wherein the sequential application of the cascaded filter comprises more than four filters in cascade~~, including SE, NW, SW, NE, SE, NW~~.